

## SEQUENCE LISTING

<110> Vanderbilt University  
Hallahan, Dennis E  
Mernaugh, Raymond

<120> PHAGE ANTIBODIES TO RADIATION-INDUCIBLE NEOANTIGENS

<130> 1242/72

<150> US 09/914,605

<151> 2001-08-30

<150> US 10/259,087

<151> 2002-09-27

<160> 34

<170> PatentIn version 3.2

<210> 1

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Gly Ser Arg Val  
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 Gly Ala Ser Val Lys Met Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr  
 20 25 30

gac tac tgg atg cac tgg gtg aag cag agg cct gga caa ggc ctt gag 144  
 Asp Tyr Trp Met His Trp Val Lys Gln Arg Pro Gly Gln Gly Leu Glu  
 35 40 45

tgg atc gga gcg att gat act tct gat agt tat act agc tac aat caa 192  
 Trp Ile Gly Ala Ile Asp Thr Ser Asp Ser Tyr Thr Ser Tyr Asn Gln  
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aag ttc aag ggc aag gcc aca ttg act gta gac gaa tcc tcc agc aca 240  
 Lys Phe Lys Gly Lys Ala Thr Leu Thr Val Asp Glu Ser Ser Ser Thr  
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gcc tac atg cag ctc agc agc ctg aca tct gag gac tct gcg gtc tat 288  
 Ala Tyr Met Gln Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr  
 85 90 95

tac tgt gca aga aga ggc tac tat agc gca ttt gat tac tgg ggc caa 336  
 Tyr Cys Ala Arg Arg Gly Tyr Tyr Ser Ala Phe Asp Tyr Trp Gly Gln  
 100 105 110

ggg act acg gtc acc gtc tcc tca ggt gga ggc ggt tca ggc gga ggt 384  
 Gly Thr Thr Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly  
 115 120 125

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| acc atg gct gca tct cca gga gag aag gtc acc atc acc tgc cgt gcc | 480 |
| Thr Met Ala Ala Ser Pro Gly Glu Lys Val Thr Ile Thr Cys Arg Ala |     |
| 145 150 155 160   |     |
| agc tca agt gta agc tac atg cac tgg ttc cag cag aag tca ggc acc | 528 |
| Ser Ser Ser Val Ser Tyr Met His Trp Phe Gln Gln Lys Ser Gly Thr |     |
| 165 170 175   |     |
| tcc ccc aaa ccc tgg att tat gac aca tcc aag ctg gct tct gga gtc | 576 |
| Ser Pro Lys Pro Trp Ile Tyr Asp Thr Ser Lys Leu Ala Ser Gly Val |     |
| 180 185 190   |     |
| cca gat cgc ttc agt ggc agt ggg tct ggg acc tct tat tct ctc aca | 624 |
| Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Ser Tyr Ser Leu Thr |     |
| 195 200 205   |     |
| atc agc tcc atg gag gct gaa gat gct gct act tat tac tgt ctg cag | 672 |
| Ile Ser Ser Met Glu Ala Glu Asp Ala Ala Thr Tyr Tyr Cys Leu Gln |     |
| 210 215 220   |     |
| agg agt agt tac ccg tac acg ttt gga gct ggc acc aag ctg gaa atc | 720 |
| Arg Ser Ser Tyr Pro Tyr Thr Phe Gly Ala Gly Thr Lys Leu Glu Ile |     |
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| Lys Arg   |     |

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|---|
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| 20 25 30  |

|   |
|---|
| Asp Tyr Trp Met His Trp Val Lys Gln Arg Pro Gly Gln Gly Leu Glu |
| 35 40 45  |

|   |
|---|
| Trp Ile Gly Ala Ile Asp Thr Ser Asp Ser Tyr Thr Ser Tyr Asn Gln |
| 50 55 60  |

Lys Phe Lys Gly Lys Ala Thr Leu Thr Val Asp Glu Ser Ser Ser Thr  
65 70 75 80

Ala Tyr Met Gln Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr  
85 90 95

Tyr Cys Ala Arg Arg Gly Tyr Tyr Ser Ala Phe Asp Tyr Trp Gly Gln  
100 105 110

Gly Thr Thr Val Thr Val Ser Ser Gly Gly Gly Ser Gly Gly Gly  
115 120 125

Gly Ser Gly Gly Gly Gly Ser Asp Ile Glu Leu Thr Gln Ser Pro Thr  
130 135 140

Thr Met Ala Ala Ser Pro Gly Glu Lys Val Thr Ile Thr Cys Arg Ala  
145 150 155 160

Ser Ser Ser Val Ser Tyr Met His Trp Phe Gln Gln Lys Ser Gly Thr  
165 170 175

Ser Pro Lys Pro Trp Ile Tyr Asp Thr Ser Lys Leu Ala Ser Gly Val  
180 185 190

Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Ser Tyr Ser Leu Thr  
195 200 205

Ile Ser Ser Met Glu Ala Glu Asp Ala Ala Thr Tyr Tyr Cys Leu Gln  
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Arg Ser Ser Tyr Pro Tyr Thr Phe Gly Ala Gly Thr Lys Leu Glu Ile  
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Lys Arg

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| Met Ala Gln Val Lys Leu Gln Gln Ser Gly Pro Glu Leu Val Lys Pro |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |     |
| 1   | 5 10 15     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |     |
| ggg gct tca gtg aag atg tcc tgc aag gct tct gga tac aca ttc act |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 96  |
| Gly Ala Ser Val Lys Met Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |     |
|   | 20 25 30    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |     |
| agc tat gtt atg cac tgg gtg aag cag aag cct ggg cag ggc ctt gag |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 144 |
| Ser Tyr Val Met His Trp Val Lys Gln Lys Pro Gly Gln Gly Leu Glu |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |     |
|   | 35 40 45    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |     |
| tgg att gga tat att aat cct tac aat gat ggt act aag tac aat gag |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 192 |
| Trp Ile Gly Tyr Ile Asn Pro Tyr Asn Asp Gly Thr Lys Tyr Asn Glu |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |     |
|   | 50 55 60    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |     |
| aag ttc aaa ggc aag gcc gca ctg act tca gac aaa tcc tcc agc aca |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 240 |
| Lys Phe Lys Gly Lys Ala Ala Leu Thr Ser Asp Lys Ser Ser Ser Thr |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |     |
| 65  | 70 75 80    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |     |
| gcc tac atg gag ctc agc agc ctg acc tct gag gac tct gcg gtc tat |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 288 |
| Ala Tyr Met Glu Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |     |
|   | 85 90 95    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |     |
| tac tgt gca aga ttt ggt aac tac ggt gct ttg gac tac tgg ggc caa |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 336 |
| Tyr Cys Ala Arg Phe Gly Asn Tyr Gly Ala Leu Asp Tyr Trp Gly Gln |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |     |
|   | 100 105 110 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |     |
| ggg acc acg gtc acc gtc tcc tca ggt gga ggc ggt tca ggc gga ggt |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 384 |
| Gly Thr Thr Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |     |
|   | 115 120 125 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |     |
| ggc tct ggc ggt ggc gga tgc gac att gag ctc acc cag tct cca aca |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 432 |
| Gly Ser Gly Gly Gly Gly Ser Asp Ile Glu Leu Thr Gln Ser Pro Thr |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |     |
|   | 130 135 140 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |     |
| atc atg tct gca tct cca ggg gag aag gtc acc ata acc tgc agt gcc |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 480 |
| Ile Met Ser Ala Ser Pro Gly Glu Lys Val Thr Ile Thr Cys Ser Ala |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |     |
| 145   | 150 155 160 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |     |
| agc tca agt gta agt tac atg cac tgg ttc cag cag aag cca ggc act |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 528 |
| Ser Ser Ser Val Ser Tyr Met His Trp Phe Gln Gln Lys Pro Gly Thr |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |     |
|   | 165 170 175 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |     |
| tct ccc aaa ccc tgg att tat ggc aca tcc aac ctg gct tct gga gtc |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 576 |
| Ser Pro Lys Pro Trp Ile Tyr Gly Thr Ser Asn Leu Ala Ser Gly Val |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |     |
|   | 180 185 190 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |     |
| cct gtt cgc ttc agt ggc agt gga tct ggg acc tct tat tct ctc aca |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 624 |
| Pro Val Arg Phe Ser Gly Ser Gly Ser Gly Thr Ser Tyr Ser Leu Thr |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |     |
|   | 195 200 205 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |     |
| atc agc agc atg gag gct gaa gat gct gcc act tat tac tgt caa cag |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 672 |
| Ile Ser Ser Met Glu Ala Glu Asp Ala Ala Thr Tyr Tyr Cys Gln Gln |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |     |
|   | 210 215 220 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |     |
| tgg agt agt tac cca ctc acg ttc gga ggg ggg acc aag ctg gaa ata |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 720 |
| Trp Ser Ser Tyr Pro Leu Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |     |
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35 40 45

Trp Ile Gly Tyr Ile Asn Pro Tyr Asn Asp Gly Thr Lys Tyr Asn Glu  
50 55 60

Lys Phe Lys Gly Lys Ala Ala Leu Thr Ser Asp Lys Ser Ser Ser Thr  
65 70 75 80

Ala Tyr Met Glu Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr  
85 90 95

Tyr Cys Ala Arg Phe Gly Asn Tyr Gly Ala Leu Asp Tyr Trp Gly Gln  
100 105 110

Gly Thr Thr Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly  
115 120 125

Gly Ser Gly Gly Gly Gly Ser Asp Ile Glu Leu Thr Gln Ser Pro Thr  
130 135 140

Ile Met Ser Ala Ser Pro Gly Glu Lys Val Thr Ile Thr Cys Ser Ala  
145 150 155 160

Ser Ser Ser Val Ser Tyr Met His Trp Phe Gln Gln Lys Pro Gly Thr  
165 170 175

Ser Pro Lys Pro Trp Ile Tyr Gly Thr Ser Asn Leu Ala Ser Gly Val  
180 185 190

Pro Val Arg Phe Ser Gly Ser Gly Ser Gly Thr Ser Tyr Ser Leu Thr  
195 200 205

Ile Ser Ser Met Glu Ala Glu Asp Ala Ala Thr Tyr Tyr Cys Gln Gln  
210 215 220

Trp Ser Ser Tyr Pro Leu Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile  
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Lys Arg

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tca cag tca ctc tcc ctc acc tgt tct gtc act ggt tac tcc atc act 96  
Ser Gln Ser Leu Ser Leu Thr Cys Ser Val Thr Gly Tyr Ser Ile Thr  
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agt aat tac tgg ggc tgg atc cgg aag ttc cca ggg aat aaa atg gag 144  
Ser Asn Tyr Trp Gly Trp Ile Arg Lys Phe Pro Gly Asn Lys Met Glu  
35 40 45  
tgg atg gga tac ata agc tac agt ggt agc act agc tac aac cca tct 192  
Trp Met Gly Tyr Ile Ser Tyr Ser Gly Ser Thr Ser Tyr Asn Pro Ser  
50 55 60  
ctc aaa agt cga atc tcc att act aga gac aca tcg aag aat cag ctc 240  
Leu Lys Ser Arg Ile Ser Ile Thr Arg Asp Thr Ser Lys Asn Gln Leu  
65 70 75 80  
ttc ctg cag ttg aac tct gta act act gag gac aca gcc aca tat tac 288  
Phe Leu Gln Leu Asn Ser Val Thr Thr Glu Asp Thr Ala Thr Tyr Tyr  
85 90 95  
tgt gca aga tat agc ctc ttt aac tac ggt agg agg gac tat gtt atg 336  
Cys Ala Arg Tyr Ser Leu Phe Asn Tyr Gly Arg Arg Asp Tyr Val Met  
100 105 110

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| gat gcc tgg ggc caa ggg acc acg gtc acc gtc tcc tca ggt gga ggc | 384 |
| Asp Ala Trp Gly Gln Gly Thr Thr Val Thr Val Ser Ser Gly Gly Gly |     |
| 115 120 125   |     |
|   |     |
| ggt tca ggc gga ggt ggc tct ggc ggt ggc gga tcg gac att gag ctc | 432 |
| Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Asp Ile Glu Leu |     |
| 130 135 140   |     |
|   |     |
| acc cag tct cca gca acc atg gct gca tct cca gga gag aaa gtc acc | 480 |
| Thr Gln Ser Pro Ala Thr Met Ala Ala Ser Pro Gly Glu Lys Val Thr |     |
| 145 150 155 160   |     |
|   |     |
| atc acc tgc cgt gcc agc tca act gta agc tac atg cac tgg ttc caa | 528 |
| Ile Thr Cys Arg Ala Ser Ser Thr Val Ser Tyr Met His Trp Phe Gln |     |
| 165 170 175   |     |
|   |     |
| cag aag cca ggc gcc tcc cct aaa ccc tgg att tat gac aca tcc aaa | 576 |
| Gln Lys Pro Gly Ala Ser Pro Lys Pro Trp Ile Tyr Asp Thr Ser Lys |     |
| 180 185 190   |     |
|   |     |
| ctg gct tct gga gtc cca gat cgc ttc agt ggc agt ggg tct ggg aca | 624 |
| Leu Ala Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr |     |
| 195 200 205   |     |
|   |     |
| gac ttc acc ctc acc att gat cct gtg cag gct gat gat att gca acc | 672 |
| Asp Phe Thr Leu Thr Ile Asp Pro Val Gln Ala Asp Asp Ile Ala Thr |     |
| 210 215 220   |     |
|   |     |
| tat tac tgt cag cag agt aag gat gat cct cgg acg ttc ggt gga ggg | 720 |
| Tyr Tyr Cys Gln Gln Ser Lys Asp Asp Pro Arg Thr Phe Gly Gly Gly |     |
| 225 230 235 240   |     |
|   |     |
| acc aag ctg gag ctg aaa cgg cgg ccg cag gtg cgc cgg tgc cgt atc | 768 |
| Thr Lys Leu Glu Leu Lys Arg Arg Pro Gln Val Arg Arg Cys Arg Ile |     |
| 245 250 255   |     |
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| cgg atc cgc tgg aac cgc gtg ccg cat                             | 795 |
| Arg Ile Arg Trp Asn Arg Val Pro His                             |     |
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| Met | Ala | Gln | Val | Gln | Leu | Gln | Glu | Ser | Gly | Pro | Gly | Leu | Val | Lys | Pro |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ser | Gln | Ser | Leu | Ser | Leu | Thr | Cys | Ser | Val | Thr | Gly | Tyr | Ser | Ile | Thr |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ser | Asn | Tyr | Trp | Gly | Trp | Ile | Arg | Lys | Phe | Pro | Gly | Asn | Lys | Met | Glu |
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Trp Met Gly Tyr Ile Ser Tyr Ser Gly Ser Thr Ser Tyr Asn Pro Ser  
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 65 70 75 80  
 Phe Leu Gln Leu Asn Ser Val Thr Thr Glu Asp Thr Ala Thr Tyr Tyr  
 85 90 95  
 Cys Ala Arg Tyr Ser Leu Phe Asn Tyr Gly Arg Arg Asp Tyr Val Met  
 100 105 110  
 Asp Ala Trp Gly Gln Gly Thr Thr Val Thr Val Ser Ser Gly Gly Gly  
 115 120 125  
 Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Asp Ile Glu Leu  
 130 135 140  
 Thr Gln Ser Pro Ala Thr Met Ala Ala Ser Pro Gly Glu Lys Val Thr  
 145 150 155 160  
 Ile Thr Cys Arg Ala Ser Ser Thr Val Ser Tyr Met His Trp Phe Gln  
 165 170 175  
 Gln Lys Pro Gly Ala Ser Pro Lys Pro Trp Ile Tyr Asp Thr Ser Lys  
 180 185 190  
 Leu Ala Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr  
 195 200 205  
 Asp Phe Thr Leu Thr Ile Asp Pro Val Gln Ala Asp Asp Ile Ala Thr  
 210 215 220  
 Tyr Tyr Cys Gln Gln Ser Lys Asp Asp Pro Arg Thr Phe Gly Gly Gly  
 225 230 235 240  
 Thr Lys Leu Glu Leu Lys Arg Arg Pro Gln Val Arg Arg Cys Arg Ile  
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Met Ala Gln Val Lys Leu Gln Gln Ser Gly Pro Glu Leu Val Lys Pro
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ggg gct tca gtg aag atg tcc tgc aag gct tct gga tac aca ttc act      96
Gly Ala Ser Val Lys Met Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr
          20          25          30

agc tat gtt atg cac tgg gtg aag cag agc aat gga aag agc ctt gag      144
Ser Tyr Val Met His Trp Val Lys Gln Ser Asn Gly Lys Ser Leu Glu
          35          40          45

tgg att gga act att gat cct tac tat ggt ggt act agc tac aac cag      192
Trp Ile Gly Thr Ile Asp Pro Tyr Tyr Gly Gly Thr Ser Tyr Asn Gln
          50          55          60

aag ttc aag ggc aag gcc aca ttg act gta gac aaa tcc tcc acc acg      240
Lys Phe Lys Gly Lys Ala Thr Leu Thr Val Asp Lys Ser Ser Thr Thr
          65          70          75          80

gcc tac ata cag ctc aag agc ctg aca tct gag gac tct gca gtc tat      288
Ala Tyr Ile Gln Leu Lys Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr
          85          90          95

tac tgt gca aga tgg gat ggt tac tac gga ggg ttt tct tac tgg ggc      336
Tyr Cys Ala Arg Trp Asp Gly Tyr Tyr Gly Gly Phe Ser Tyr Trp Gly
          100          105          110

caa ggg acc atg gtc acc gtc tcc tca ggt gga ggc ggt tca ggc gga      384
Gln Gly Thr Met Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly Gly
          115          120          125

ggg ggc tct ggc ggt ggc gga tgc gac att gag ctc acc cag tct cca      432
Gly Gly Ser Gly Gly Gly Gly Ser Asp Ile Glu Leu Thr Gln Ser Pro
          130          135          140

gca atc atg tct gca act cta ggg gag aag gtc acc atg agc tgc agg      480
Ala Ile Met Ser Ala Thr Leu Gly Glu Lys Val Thr Met Ser Cys Arg
          145          150          155          160

gcc agc tca aat gta aag tac atg tac tgg tac cag cag aag tca ggt      528
Ala Ser Ser Asn Val Lys Tyr Met Tyr Trp Tyr Gln Gln Lys Ser Gly
          165          170          175

gcc tcc ccc aaa cta tgg att tat tac aca tcc aac ctg gct tct gga      576
Ala Ser Pro Lys Leu Trp Ile Tyr Tyr Thr Ser Asn Leu Ala Ser Gly
          180          185          190

gtc cca gct cgc ttc agt ggc agt ggg tct ggg acc tct tat tct ctc      624
Val Pro Ala Arg Phe Ser Gly Ser Gly Ser Gly Thr Ser Tyr Ser Leu
          195          200          205

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|   |     |
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| aca atc agc agc gtg gag gct gaa gat gct gcc act tat tac tgc cag | 672 |
| Thr Ile Ser Ser Val Glu Ala Glu Asp Ala Ala Thr Tyr Tyr Cys Gln |     |
| 210 215 220   |     |

|   |     |
|---|-----|
| cag ttt act agt tcc ccg tat acg ttc gga tcg ggc acc aag ctg gaa | 720 |
| Gln Phe Thr Ser Ser Pro Tyr Thr Phe Gly Ser Gly Thr Lys Leu Glu |     |
| 225 230 235 240   |     |

|   |     |
|---|-----|
| atc aaa cgg gcg gcc gca ggt gcg ccg gtg ccg tat ccg gat ccg ctg | 768 |
| Ile Lys Arg Ala Ala Ala Gly Ala Pro Val Pro Tyr Pro Asp Pro Leu |     |
| 245 250 255   |     |

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| gaa ccg cgt gcc gca tag | 786 |
| Glu Pro Arg Ala Ala     |     |
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| 20 25 30  |

|   |
|---|
| Ser Tyr Val Met His Trp Val Lys Gln Ser Asn Gly Lys Ser Leu Glu |
| 35 40 45  |

|   |
|---|
| Trp Ile Gly Thr Ile Asp Pro Tyr Tyr Gly Gly Thr Ser Tyr Asn Gln |
| 50 55 60  |

|   |
|---|
| Lys Phe Lys Gly Lys Ala Thr Leu Thr Val Asp Lys Ser Ser Thr Thr |
| 65 70 75 80   |

|   |
|---|
| Ala Tyr Ile Gln Leu Lys Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr |
| 85 90 95  |

|   |
|---|
| Tyr Cys Ala Arg Trp Asp Gly Tyr Tyr Gly Gly Phe Ser Tyr Trp Gly |
| 100 105 110   |

|   |
|---|
| Gln Gly Thr Met Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly Gly |
| 115 120 125   |

Gly Gly Ser Gly Gly Gly Gly Ser Asp Ile Glu Leu Thr Gln Ser Pro  
 130 135 140

Ala Ile Met Ser Ala Thr Leu Gly Glu Lys Val Thr Met Ser Cys Arg  
 145 150 155 160

Ala Ser Ser Asn Val Lys Tyr Met Tyr Trp Tyr Gln Gln Lys Ser Gly  
 165 170 175

Ala Ser Pro Lys Leu Trp Ile Tyr Tyr Thr Ser Asn Leu Ala Ser Gly  
 180 185 190

Val Pro Ala Arg Phe Ser Gly Ser Gly Ser Gly Thr Ser Tyr Ser Leu  
 195 200 205

Thr Ile Ser Ser Val Glu Ala Glu Asp Ala Ala Thr Tyr Tyr Cys Gln  
 210 215 220

Gln Phe Thr Ser Ser Pro Tyr Thr Phe Gly Ser Gly Thr Lys Leu Glu  
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Ser

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Val Cys

<210> 28  
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<400> 28

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<400> 29



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Ser Cys

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Ser Lys

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<223> Poly-serine-glycine negative control peptide

<400> 34

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Ser